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(71) Applicant: CANDY S.p.A.
I-20052 Monza (Milano) (IT)

(72) Inventor: Fumagalli, Silvano
20052 Monza (MI) (IT)

(74) Representative: Mittler, Enrico
c/o Mittler & C. s.r.l.,
Viale Lombardia, 20
20131 Milano (IT)

(54) Dishwater with height adjustable rack

(57) A dishwasher (1) is described comprising a washing tank (2) housing at least one rack (3) sliding along lateral guides (4) of the tank to which said rack (3) is connected by means of sliding means (101, 102) provided with adjustment means (7) that are suitable to selectively vary the vertical position of said rack. The adjustment means (7) for the height of the rack comprise at least a first vertically displaceable element (8) associated with the rack (3), at least one second element (6) associated with the sliding means (101, 102) and at

least one third revolving element (13) that can rotate in a single sense, said second element (6) co-operating with said first element (8) so that by applying an upward force to the rack (3) an upper position and a lower position are defined between which said rack (3) can be moved, said third revolving element (13) being in locking engagement with said second element (6) when in said lower and upper positions of the rack (3) and in locking engagement with said first element (8) when in said upper position of the rack (3).

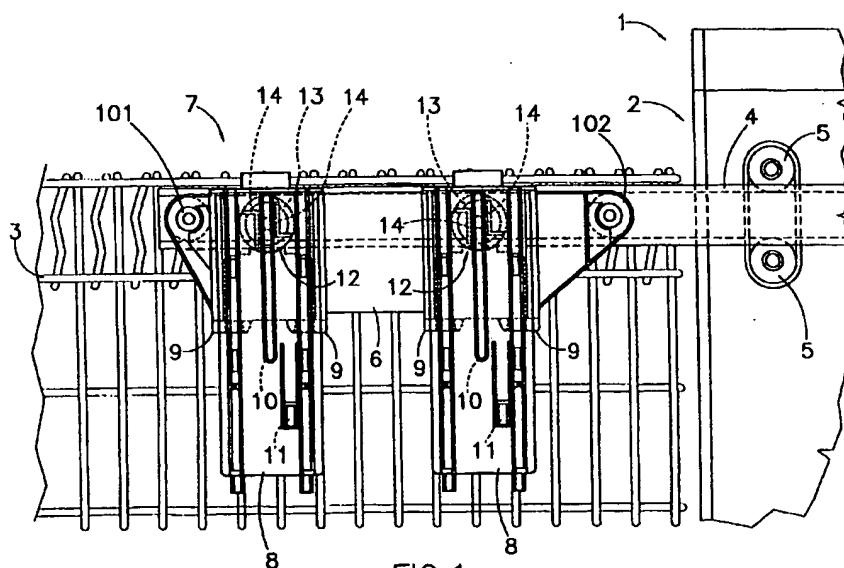


FIG.1

Description

[0001] The present invention refers to a dishwasher with rack adjustable in height.

[0002] There are known dishwashers, in particular for household use, that have inside of a tank a rack that is extractable and selectively adjustable in height in order to support dishes having various sizes.

[0003] A dishwasher of such type is known for instance from DE-A-4228954 in which a dishwasher rack is laterally provided with elastically biased levers, each one of which exhibits three grooves at different heights in which a tang belonging to a triangular plate sliding along a guide predisposed for the horizontal sliding of the rack is selectively engageable. The adjustment of the height of the rack is carried out by horizontal pressure on the fore ends of the levers so as to take the tangs out of the grooves in which they are inserted, followed by lifting or lowering of the rack up to the desired position and by the insertion of the tangs into a new groove by release of the levers. The height adjustment of the rack is carried out by operating separately on each lever.

[0004] This solution however has proven to be particularly uncomfortable in use, since the height adjustment of the rack requires, for every side of the same, a double operation consisting in the action on the levers for the extraction and the subsequent insertion of the tangs into the grooves and in the vertical sliding of the rack.

[0005] In view of the state of the art herein described, scope of the present invention is to present a dishwasher with a device for the height adjustment of the rack that is simpler in use as compared to the known devices.

[0006] According to the present invention, such scope is attained by means of a dishwasher comprising a washing tank housing at least a rack sliding along lateral guides of the tank with which said rack is connected by sliding means provided with adjustment means that are suitable to selectively vary the vertical position of said rack, characterised in that said means for the adjustment of the height of the rack comprise at least one first vertically displaceable element associated with the rack, at least one second element associated with the sliding means and at least one third revolving element that can rotate in a single sense, said second element co-operating with said first element and with said third element in such a way that by applying an upward force to the rack an upper position and a lower position are defined between which said rack can be moved, said third revolving element being in locking engagement with said second element in said lower and upper positions of the rack and in locking engagement with said first element in said upper position of the rack.

[0007] Owing to the present invention it is possible to realise a dishwasher with a device that allows a height adjustment of the rack in a simple and quick manner by lifting of the rack only.

[0008] The characteristics and the advantages of the

present invention will become evident from the following detailed description of an embodiment thereof, that is illustrated as a non limiting example in the enclosed drawings, in which:

5 Figure 1 is a schematic side view of a dishwasher with extracted rack provided with a device for the adjustment of the height according to the present invention;
 10 Figure 2 is a schematic side view of the rack in Figure 1 during the lifting stage;
 15 Figure 3 is a schematic side view of the rack in Figure 1 in lifted position;
 20 Figure 4 is a schematic side view of the rack in Figure 1 during the lowering stage;
 25 Figure 5 is a side view of a detail of the device for the adjustment of the height of the rack in Figure 1;
 30 Figure 6 is a section view according to the line VI-VI of the detail of the device in Figure 5;
 35 Figure 7 is a section view according to the line VII-VII of a detail of the device for the adjustment of the height of the rack in Figure 3.

[0009] With reference to the annexed figures a dishwasher 1 provided with a washing tank 2 is shown that houses at least one rack 3 extractable from the tank 2 and suitable to support the dishes to be washed. The rack 3 is preferably made of plasticized metal rod and it is sliding horizontally along lateral guides 4 having substantially C-shape that are slidably mounted on rollers 5 hinged on respective side walls of the tank 2. The rack 3 is connected with guides 4 by means of rollers 101, 102 that engage inside the same guides. Said rollers are connected with a flange 6 that is part of a device 7 that allows the lifting of the rack 3. Two devices 7 for the lifting of rack 3 are provided but only one device 7 will be described hereinafter.

[0010] Said device 7 comprises also a pair of walls 8 that are fixedly mounted to the rack 3 and sliding along appropriate guides 9 of the flange 6. Said walls 8 are each provided with central projections 10 on the surface facing the flange 6 and with an elastic hook 11 that is placed on the bottom and better shown in Figure 7.

[0011] On the flange 6 housings 12 are provided in which rollers 13 are revolvably hinged that are placed each one in correspondence of each wall 8. Said rollers 13 are each provided with a pair of L-shaped projections 14 that can act as a guide for the central projection 10 of each wall 8. In addition, the rollers 13 are provided with teeth 15 on the lower surface that can singularly couple to an appropriate cavity 16 that is provided in the housings 12 of the flange 6 in such a way so as to allow the locking of the respective rollers 13 or the single counter-clockwise rotary movement by external operation, as better visible in Figures 5 and 6. The housings 12 are provided with round guides 70 for the rollers 13 and with holes 71 in which the pins 72 of the rollers 13 are inserted. Preferably the cavity 16 is made into an

elastic tang 80 belonging to the same housing 12.

[0012] The device 7 allows the height adjustment of the rack 3 between an upper position and a lower position shown respectively in figures 3 and 1. In the lower position shown in Figure 1, the upper edges of the walls 8 rest on the upper edge of the flange 6, the central projection 10 of the walls 8 is inserted between the pair of L-shaped projections 14 of each roller 13.

[0013] In order to move one or both sides of the rack 3 in the upper position it is sufficient to lift the rack 3. In this way the walls 8 raise as compared with the flange 6, the central projection 10 of each wall 8 slides between the L-shaped projections 14 of the rollers 13 along its entire length, as visible in Figure 2. During the lifting upward stage of the rack 3 the elastic hook 11 of each wall 8 hooks one of the L-shaped projections 14 of each roller 13 thus allowing the rotation of the same roller in counter-clockwise sense and the subsequent locking of one of its teeth 15 in the cavity 16 allows the positioning of the same so that one of the L-shaped projections 14 is thus positioned as a lock for the central guide 10 of walls 8. In this way the lowering of the walls 8 and therefore of the rack 3 is prevented and the same rack due to gravity gets into the upper position in Figure 3 in which the lower end of the central projection 10 of each wall 8 is in abutment with one of the L-shaped projections 14 of each roller 13 and the elastic hook 11 gets under the L-shaped projections 14; during its descent the hook 11 does not cause a rotation of the rollers 13 by means of the action on the L-shaped projections 14 since the rollers 13 cannot rotate clockwise as they are locked by the previous insertion of one of the teeth 15 in the cavity 16.

[0014] In order to bring the rack 3 back to the normal lower position it is sufficient to lift the same rack for a short additional distance so that the elastic hook 11 acts on one of the L-shaped projections 14 so as to unlock each roller 13 thus determining a counter-clockwise rotation of the same, as visible in Figure 4. The subsequent locking of one of the teeth 15 of each roller 13 in the appropriate cavity 16 allows the positioning of the L-shaped projections 14 as a guide for the central projection 10 of the walls 8. The projection 10 of each wall 8 can slide vertically downwards due to the gravity thus determining the descent of the rack 3 and its arrangement in the lower position in Figure 1.

[0015] From what herein described the constructive simplicity of the present invention and the particular easiness in which the rack 3 can be adjusted by a single and simple manual operation of lifting of the dishwasher that does not require specific intervention on behalf of the user are evident.

[0016] The dishwasher previously described can be subject to several modifications within the sphere of the present invention. For instance the walls 8 of the lifting device 7 can be provided with two central guides 10 and two elastic hooks 11 so as to allow the adjustment of the rack 3 in more than two different vertical positions.

Claims

1. Dishwasher (1) comprising a washing tank (2) housing at least one rack (3) sliding along lateral guides (4) of the tank to which said rack (3) is connected by means of sliding means (101, 102) provided with adjustment means (7) that are suitable to selectively vary the vertical position of said rack, **characterised in** that said adjustment means (7) for the height of the rack comprise at least one first vertically displaceable element (8) associated with the rack (3), at least one second element (6) associated with the sliding means (101, 102) and at least one third revolving element (13) that can rotate in a single sense, said second element (6) co-operating with said first element (8) so that by applying an upward force to the rack (3) an upper position and a lower position are defined between which said rack (3) can be moved, said third revolving element (13) being in locking engagement with said second element (6) when in said lower and upper positions of the rack (3) and in locking engagement with said first element (8) when in said upper position of the rack (3).
2. Dishwasher according to claim 1, **characterised in** that said third revolving element (13) is a roller provided with a pair of top projections (14) and of bottom teeth (15) that individually engage the cavity (16) of a housing (12) of the roller in said second element (6).
3. Dishwasher according to claim 1, **characterised in** that said first element (8) comprises at least one wall (8) provided with a hook (11) and one vertical projection (10) on the surface facing the second element (6), said hook (11) co-operating with said pair of projections (14) of the roller (13) in such a way as to make said roller (13) commute in a first position corresponding to the upper position of the rack (3) in which said pair of projections (14) of the roller are arranged as a lock for said vertical projection (10) of the wall and in a second position corresponding to the lower position of the rack (3) in which said projections (14) of the roller (13) are arranged so as to act as guides for said vertical projection (10) of the wall (8).
4. Dishwasher according to claim 2, **characterised in** that said projections (14) of the roller (13) are L-shaped projections.
5. Dishwasher according to claim 3, **characterised in** that said vertical projection (11) of the wall (8) is a substantially central projection.
6. Dishwasher according to claim 3, **characterised in** that said second element (6) is a flange provided

with guides (9) for the vertical sliding of said wall (8).

7. Dishwasher according to claim 1, **characterised in that** said at least first (8), second (6) and third element (13) are two and they are connected with opposite sides of the rack (3). 5
8. Dishwasher according to claim 7, **characterised in that** said first element (8) comprises two walls (8) and said third element (13) comprises two rollers (13). 10

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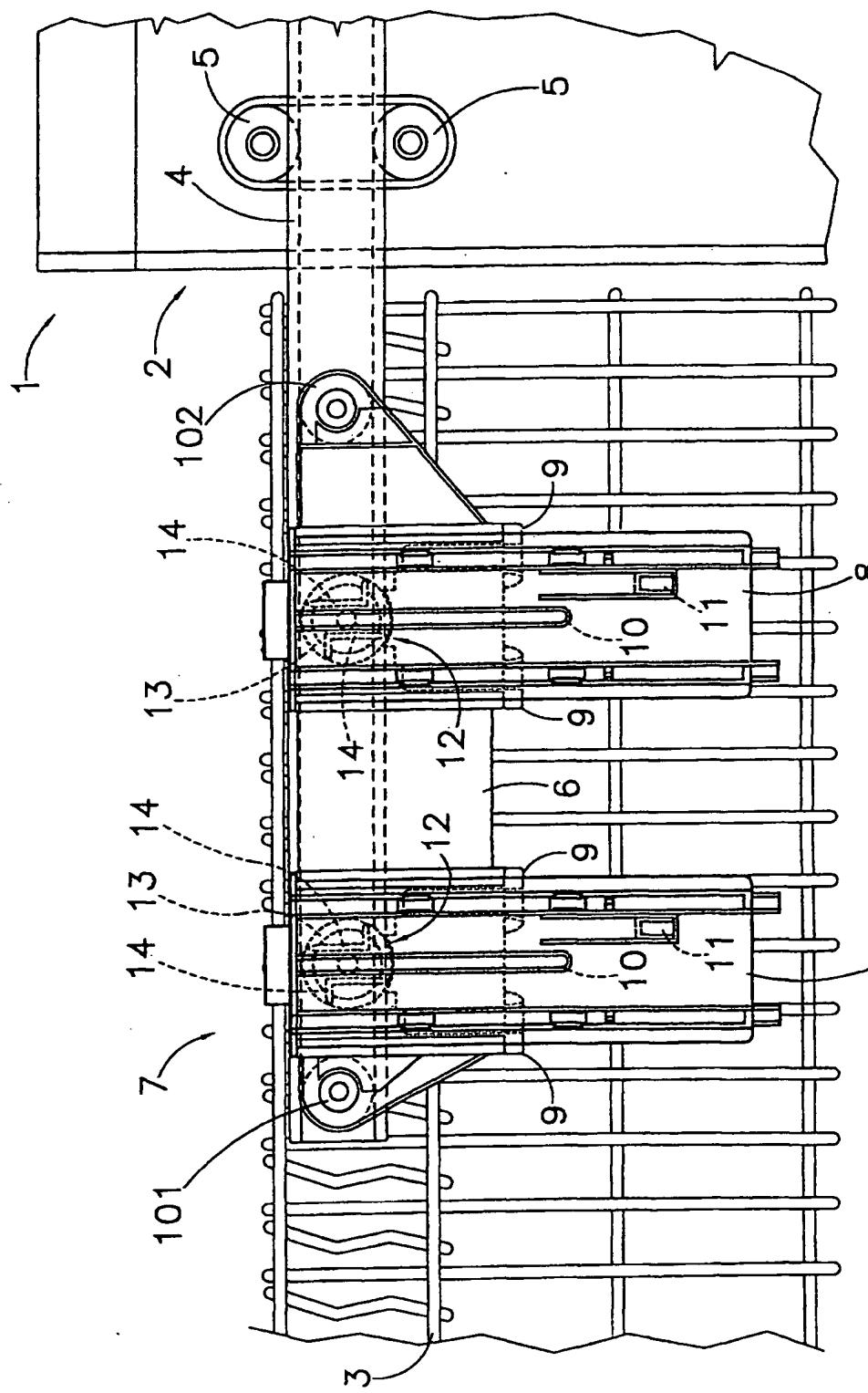


FIG. 1

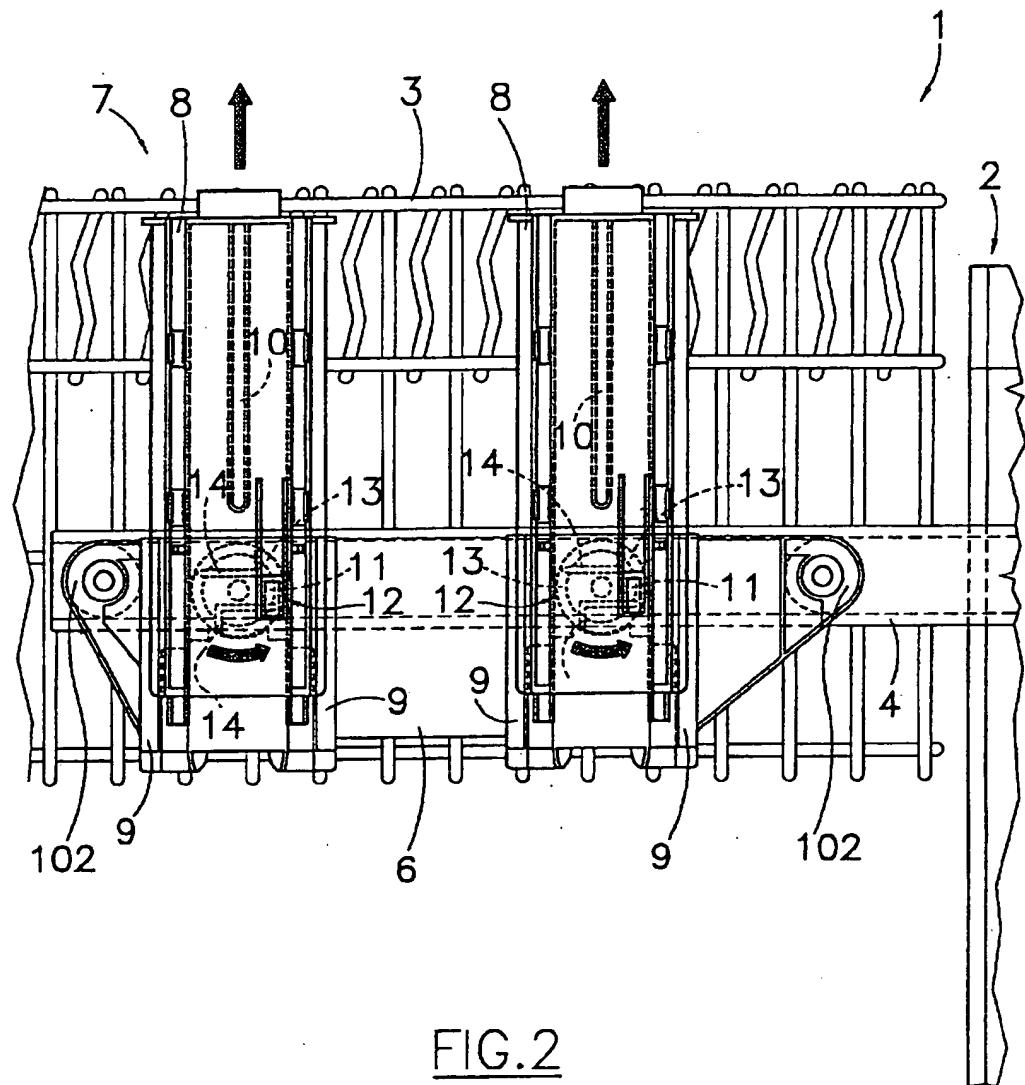


FIG.2

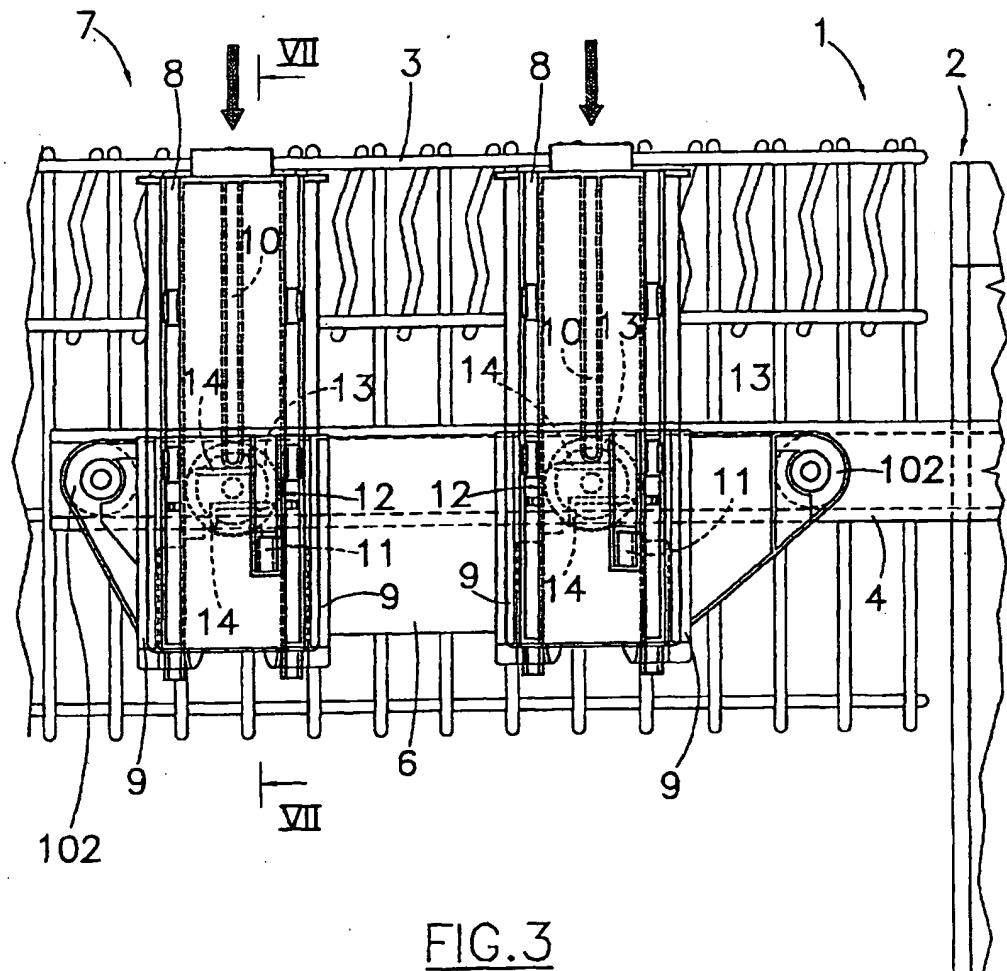


FIG.3

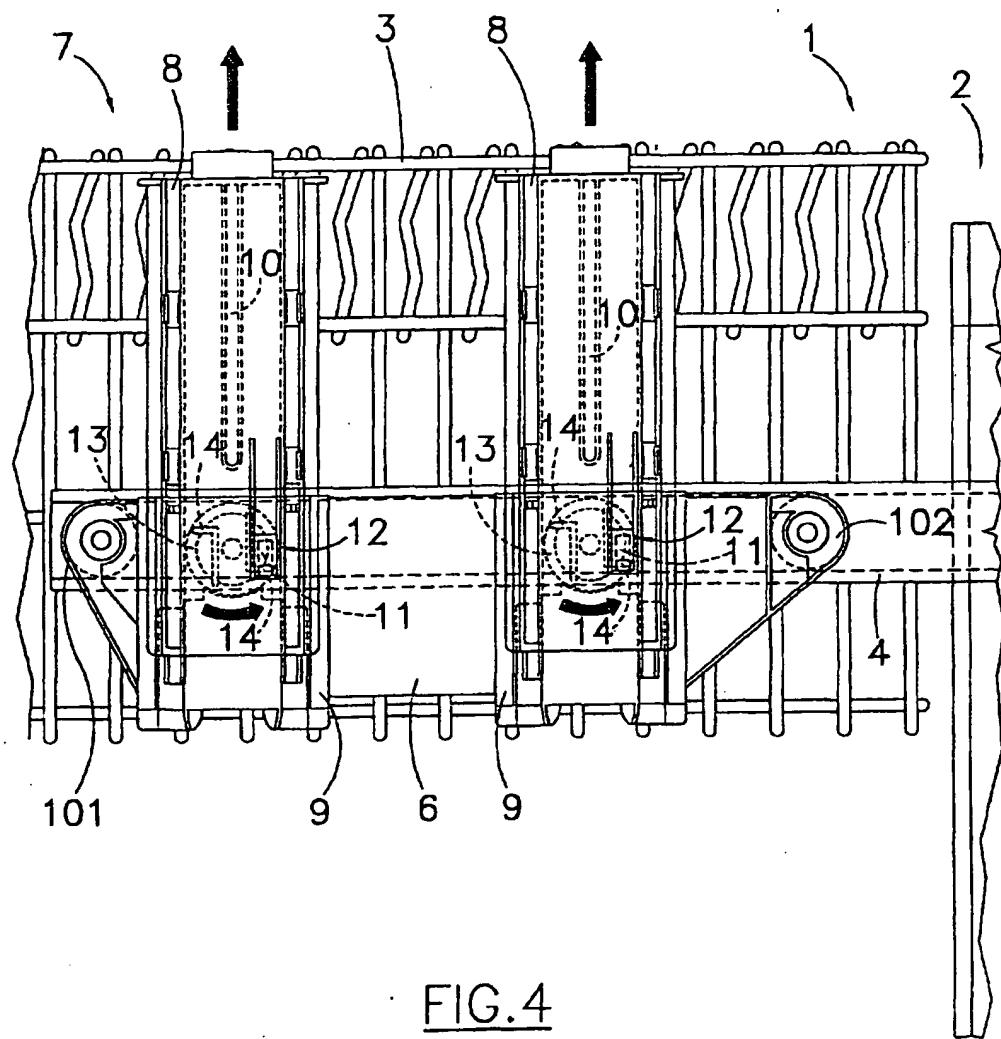


FIG. 4

